

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

**Amendments to the Claims:**

1. (Withdrawn) A personal hair removal device comprising:  
a substrate;  
a plurality of blades connected to said substrate, each of said blades comprising at least one cutting edge with a radius of curvature not greater than about 1000 angstroms.
2. (Withdrawn) A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 500 angstroms.
3. (Withdrawn) A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 250 angstroms.
4. (Withdrawn) A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 75 angstroms.
5. (Withdrawn) A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 50 angstroms.
6. (Withdrawn) A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 30 angstroms.
7. (Withdrawn) A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 10 angstroms.
8. (Withdrawn) A hair removal device according to claim 1 comprising at least about 10 blades.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

9. (Withdrawn) A hair removal device according to claim 1 comprising at least about 50 blades.
10. (Withdrawn) A hair removal device according to claim 1 comprising at least about 100 blades.
11. (Withdrawn) A hair removal device according to claim 1 comprising at least about 200 blades.
12. (Withdrawn) A hair removal device according to claim 1 comprising at least about 500 blades.
13. (Withdrawn) A hair removal device according to claim 1 comprising at least about 1000 blades.
14. (Withdrawn) A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 1000 microns.
15. (Withdrawn) A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 500 microns.
16. (Withdrawn) A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 250 microns.
17. (Withdrawn) A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 100 microns.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

18. (Withdrawn) A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 75 microns.
19. (Withdrawn) A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 50 microns.
20. (Withdrawn) A hair removal device according to claim 1 wherein said cutting edges are straight.
21. (Withdrawn) A hair removal device according to claim 1 wherein said cutting edges are serrated.
22. (Withdrawn) A hair removal device according to claim 1 wherein said cutting edges are curved.
23. (Withdrawn) A hair removal device according to claim 1 wherein a plurality of said blades are mounted on separate blade supports.
24. (Withdrawn) A hair removal device according to claim 1 wherein said blades are arranged in ordered columns and rows on said substrate.
25. (Withdrawn) A hair removal device according to claim 1 wherein said blades are arranged in staggered columns and rows on said substrate.
26. (Withdrawn) A hair removal device according to claim 1 further comprising at least one guard element comprising a skin engaging surface.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

27. (Withdrawn) A hair removal device according to claim 1 further comprising a plurality of guard elements each comprising at least one skin engaging surface.
28. (Withdrawn) A hair removal device according to claim 26 wherein said guard element is formed of a resilient material.
29. (Withdrawn) A hair removal device according to claim 27 wherein at least some of said guard elements are disposed between some of said blades.
30. (Withdrawn) A hair removal device according to claim 1 wherein at least some of said cutting edges are oriented in different directions.
31. (Withdrawn) A hair removal device according to claim 1 wherein at least some of said cutting edges are oriented in at least two different directions which are angled at least about 90° to each other.
32. (Withdrawn) A hair removal device according to claim 1 wherein said substrate is flexible.
33. (Withdrawn) A hair removal device comprising:  
a substrate;  
a plurality of blades connected to said substrate, wherein said blades comprise a cutting depth of not greater than about 1000 microns.
34. (Withdrawn) A hair removal device according to claim 33 wherein said cutting depth is not greater than about 500 microns.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

35. (Withdrawn) A hair removal device according to claim 33 wherein said cutting depth is not greater than about 250 microns.
36. (Withdrawn) A hair removal device according to claim 33 wherein said cutting depth is not greater than about 100 microns.
37. (Withdrawn) A hair removal device according to claim 33 wherein said cutting depth is not greater than about 75 microns.
38. (Withdrawn) A hair removal device according to claim 33 wherein said cutting depth is not greater than about 50 microns.
39. (Withdrawn) A hair removal device according to claim 33 comprising at least 10 blades.
40. (Withdrawn) A hair removal device according to claim 33 comprising at least about 50 blades.
41. (Withdrawn) A hair removal device according to claim 33 comprising at least about 100 blades.
42. (Withdrawn) A hair removal device according to claim 33 comprising at least about 200 blades.
43. (Withdrawn) A hair removal device according to claim 33 comprising at least about 500 blades.

Application No. 09/626,193

Amdt. Dated 10/12/2004

Reply to Office Action of 07/15/2004

44. (Withdrawn) A hair removal device according to claim 33 comprising at least about 1000 blades.

45. (Withdrawn) A hair removal device according to claim 33 wherein said blades comprise a radii of curvature not greater than about 1000 angstroms.

46. (Withdrawn) A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 500 angstroms.

47. (Withdrawn) A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 250 angstroms.

48. (Withdrawn) A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 100 angstroms.

49. (Withdrawn) A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 50 angstroms.

50. (Withdrawn) A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 30 angstroms.

51. (Withdrawn) A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 10 angstroms.

52. (Withdrawn) A hair removal device according to claim 33 wherein said cutting edges are straight.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

53. (Withdrawn) A hair removal device according to claim 33 wherein said cutting edges are serrated.
54. (Withdrawn) A hair removal device according to claim 33 wherein said cutting edges are curved.
55. (Withdrawn) A hair removal device according to claim 33 wherein said blades are mounted on separate blade supports.
56. (Withdrawn) A hair removal device according to claim 33 wherein said blades are arranged in ordered columns and rows on said substrate.
57. (Withdrawn) A hair removal device according to claim 33 wherein said blades are arranged in staggered columns and rows on said substrate.
58. (Withdrawn) A hair removal device according to claim 33 further comprising at least one guard element comprising a skin engaging surface.
59. (Withdrawn) A hair removal device according to claim 33 further comprising a plurality of guard elements each comprising at least one skin engaging surface.
60. (Withdrawn) A hair removal device according to claim 33 wherein at least some of said guard elements are disposed between some of said blades.
61. (Withdrawn) A hair removal device according to claim 33 wherein at least some of said cutting edges are oriented in different directions.

Application No. 09/626,193

Amdt. Dated 10/12/2004

Reply to Office Action of 07/15/2004

62. (Withdrawn) A hair removal device according to claim 33 wherein said substrate is flexible.

63. (Withdrawn) A hair removal device according to claim 33 wherein at least some of said cutting edges are oriented in at least two different directions which are angled at least about 90°.

64. (Currently Amended) A hair removal device comprising:

a substantially planar and rigid substrate; and

at least 100 micro-blades connected to said substrate, wherein the micro-blades are configured for cutting hair when drawn across a skin surface and without damaging the skin.

65. (Cancelled)

66. (Cancelled)

67. (Original) A hair removal device according to claim 64 comprising at least about 200 of said micro-blades.

68. (Original) A hair removal device according to claim 64 comprising at least about 500 of said micro-blades.

69. (Original) A hair removal device according to claim 64 comprising at least about 1000 of said micro-blades.

70. (Withdrawn) A hair removal device according to claim 64 wherein said blades



Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

comprise a radii of curvature not greater than about 1000 angstroms.

71. (Withdrawn) A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 500 angstroms.

72. (Withdrawn) A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 250 angstroms.

73. (Withdrawn) A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 100 angstroms.

74. (Withdrawn) A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 50 angstroms.

75. (Withdrawn) A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 10 angstroms.

76. (Withdrawn) A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 1000 microns.

77. (Withdrawn) A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 500 microns.

78. (Withdrawn) A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 250 microns.

79. (Withdrawn) A hair removal device according to claim 64 wherein said blades

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

comprise a cutting depth of not greater than about 100 microns.

80. (Withdrawn) A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 75 microns.

81. (Withdrawn) A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 50 microns.

82. (Withdrawn) A hair removal device according to claim 64 wherein said cutting edges are straight.

83. (Withdrawn) A hair removal device according to claim 64 wherein said cutting edges are serrated.

84. (Withdrawn) A hair removal device according to claim 64 wherein said cutting edges are curved.

85. (Original) A hair removal device according to claim 64 wherein said blades are each mounted on separate blade supports.

86. (Original) A hair removal device according to claim 64 wherein said blades are arranged in ordered columns and rows on said substrate.

87. (Original) A hair removal device according to claim 64 wherein said blades are arranged in staggered columns and rows on said substrate.

88. (Withdrawn) A hair removal device according to claim 64 further comprising at

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

least one guard element comprising a skin engaging surface.

89. (Withdrawn) A hair removal device according to claim 64 further comprising a plurality of guard elements each comprising at least one skin engaging surface.

90. (Withdrawn) A hair removal device according to claim 64 wherein at least some of said guard elements are disposed between some of said blades.

91. (Withdrawn) A hair removal device according to claim 64 wherein at least some of said cutting edges are oriented in different directions.

92. (Withdrawn) A hair removal device according to claim 64 wherein at least some of said cutting edges are oriented in at least two different directions which are angled at least about 90°.

93. (Withdrawn) A hair removal device according to claim 64 wherein said substrate is flexible.

94. (Withdrawn) A hair removal device comprising:

a substrate;

at least about 100 micro abrasive elements connected to said substrate.

95. (Withdrawn) A hair removal device according to claim 94 wherein said substrate is flexible.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

96. (Withdrawn) A method of making a personal hair removal device comprising the steps of:
- providing a substrate;
  - depositing a thin film of at least one etchable material on said substrate;
  - and
  - etching a plurality of cutting edges in said deposited film.
97. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said etching step also comprises etching blade supports.
98. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said etching steps also comprises etching skin engaging elements which do not have sharp edges.
99. (Withdrawn) A method of making a personal hair removal device according to claim 96 further comprising the step of creating a pattern on said deposited film prior to said etching step.
100. (Withdrawn) A method of making a personal hair removal device according to claim 99 wherein said pattern is created by photolithography.
101. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises providing a flexible substrate.
102. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises polyimide.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

103. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises polyetheretherketone (PEEK).
104. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises providing a flexible substrate having a thickness of about 0.05 mm to about 2 mm.
105. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises providing a flexible substrate having a thickness of about 0.1 mm to about 0.5 mm.
106. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said step of depositing a thin film of etchable material comprises depositing a material selected from the group consisting of tungsten, tantalum nitride, boron nitride, diamond, and combinations thereof.
107. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing chemical vapor deposition.
108. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing plasma assisted chemical vapor deposition.
109. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing electron cyclotron resonance deposition.

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

110. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing sputter deposition.

111. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing radio frequency assisted deposition.

112. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said etching step comprises sputtering.

113. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said etching step comprises reactive ion etching.

114. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said etching step comprises ion milling.

115. (Withdrawn) A method of making a personal hair removal device according to claim 96 wherein said etching step comprises wet chemical etching.

116. (New) The hair removal device of claim 64 wherein:  
the substrate has a generally flat upper surface; and  
the micro-blades each comprise; a blade support attached to the substrate and extending above the generally flat upper surface of the substrate, and a blade attached to the blade support and elevated above the upper surface of the substrate, wherein:  
the blade defines a cutting edge; and  
the cutting edge is adapted in size and shape and oriented relative to the

Application No. 09/626,193  
Amdt. Dated 10/12/2004  
Reply to Office Action of 07/15/2004

upper surface to cut hair when drawn across a skin surface and without damaging the skin surface.

117. (New) The hair removal device of claim 116 wherein the blade support of each micro-blade is generally perpendicular to the upper surface of the substrate.

118. (New) The hair removal device of claim 116 wherein each cutting edge is generally parallel to the upper surface of the substrate.